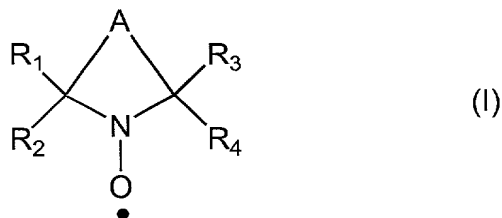
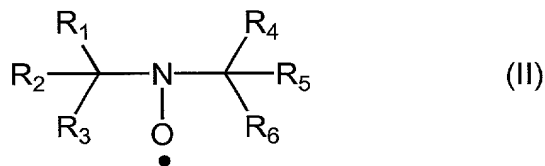


We Claim:

1. A method of oxidizing carbohydrates having primary alcohol groups comprising adding a hydroperoxide to the carbohydrate which is in contact with a nitroxyl radical mediator, wherein said method is catalyzed by a peroxidase enzyme in the presence of a halide.
2. The method of Claim 1 wherein the hydroperoxide is hydrogen peroxide.
3. The method of Claim 1 wherein the carbohydrate is a polysaccharide.
4. The method of Claim 3 wherein the polysaccharide is selected from the group consisting of starch and cellulose pulp.
5. The method of Claim 1 wherein the nitroxyl radical mediator is a di-tertiary alkyl nitroxyl radical has a formula selected from the group consisting of:

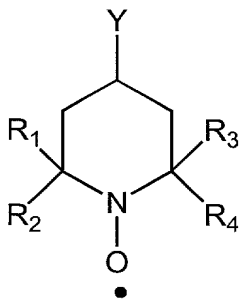


and



wherein A represents a chain of preferably two or three atoms, in particular carbon atoms or a combination of one or two carbon atoms with an oxygen or nitrogen atom, and the R groups represent the same or different alkyl groups.

6. The method of Claim 1 wherein the nitroxyl radical mediator has the formula:



5 where Y is H, OH, O-C(O)-CH₃ or NH-C(O)-CH₃.

7. The method of Claim 2 wherein the peroxidase enzyme is derived from an animal source.
8. The method of Claim 2 wherein the peroxidase enzyme is selected from the group consisting of lactoperoxidase ("LPO"), myeloperoxidase ("MPO"), eosinophil peroxidase ("EPO"), thyroid peroxidase ("TPO"), ovoperoidase, salivary peroxidase, and vanadium haloperoidase.
- 10 9. The method of Claim 1 wherein the halide ion is bromide.
- 10 10. The method of claim 9 wherein the peroxidase enzyme is LPO; the temperature of the reaction is kept between about 10 °C to about 70 °C; the pH is between about 3.0 to about 9.0; and the nitroxyl radical mediator is present in an amount of between about 0.01 to about 50 wt% by weight of the carbohydrate.
- 15 11. The method of claim 10 wherein the temperature of the reaction is kept between about 20 °C to about 50 °C; the pH is between about 4.5 to about 6.5; and the nitroxyl radical mediator is present in an amount of between about 0.1 to about 20 wt% by weight of the carbohydrate.
- 20 12. The oxidized carbohydrate prepared by the process of Claim 1.

13. A method of preparing nitrosonium ion comprising adding a hydroperoxide to a solution of a nitroxyl radical mediator, wherein said method is catalyzed by a peroxidase enzyme in the presence of a halide

14. The paper or absorbent product prepared from the oxidized carbohydrate of Claim 1.

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